REMARKS/ARGUMENTS

Favorable reconsideration of the present application is respectfully requested.

Claims 1-12, 14-17 and 19-39 have been canceled in favor of new Claims 40-49. The new claims are believed to define over the cited prior art.

The term "base-operation condition" is used for simplicity to describe an operation condition before that is modified by "body items" such as weight, and "imaging items" such as a necessary dose of effective component of the contrast medium per unit weight of the subject, and is therefore not new matter.

With respect to "including a predetermined injection time," page 14, lines 21 to page 15, line 2 discloses that "When the total amount of the contrast medium to be injected is thus calculated, if the data of the injection rate is registered according to a variable pattern having a waveform as shown in Fig. 10, then the waveform of the variable pattern is vertically moved while the period of time consumed to inject the contrast medium remains unchanged, so that the area surrounded by the waveform, the x-axis, and the y-axis corresponds to the total amount of the contrast medium to be injected." Therefore, the injection time is stored as one of the items that specify the base-operation condition.

The term "time-injection rate pattern" is used to describe an injection pattern of contrast medium after modified by "body items" and "imaging items", and is therefore is not new matter.

The injection of contrast medium containing iodine for CT scanning will be discussed as a non-limiting example. Conventionally, injection of a contrast medium for CT scanning was performed according to the experience of operators/doctors by setting a injection rate of the contrast medium to be used, such as 3 ml/sec, 4 ml/sec, etc. CT scanning is performed within the period in which CT value exceeds a required value in a time-contrast enhancement curve (i.e. time-CT value curve). However, if the CT scanning period is not inside the period

having a certain CT value or higher in a time-contrast enhancement curve, intended diagnostics is not possible. Therefore, conventionally, an amount of the contrast medium more than necessary is injected to obtain sufficiently longer effective contrast-enhancement period. However, contrast medium is by no means good for patients, especially for those having a kidney disorder and the amount to be used is desirably as small as possible.

In the present invention, the condition storage function retains the data of a base-operation condition for human body regions, a necessary dose of effective component of the contrast medium per unit weight of the subject for the human body regions, and a concentration of the effective component of usable contrast medium products.

Herein, "base-operation condition" is a base data for calculating the time-injection rate pattern and includes predetermined pattern, such as variable pattern, with a predetermined injection time. The "base-operation condition" for each human body region is independent of each other, i.e. the base-operation condition for heart is independent, generally different, from that for lung.

The necessary amount of contrast medium, is calculated based on the necessary dose of the effective component of the contrast medium per unit weight, which is modified by the weight of the subject and the concentration of the effective component of the contrast medium product to be used.

In the present invention, the time-injection rate pattern is obtained by modifying the base-operation condition by the calculated necessary amount of the contrast medium. Herein, the injection time (injection duration) is predetermined and therefore the injection rate is modified, see page 14, lines 21 to page 15, line 2. That is, the injection time is constant regardless of the amount of contrast medium to be injected. The advantage is that the variation of the peak time in a time-contrast enhancement curve (i.e. time-CT value curve) is small even if the amount of injected contrast medium is increased or decreased. In general,

the scanning of CT apparatus is started after the CT value in the time-contrast enhancement curve reach or beyond certain value. In this method, since the variation of the peak time in the time-contrast enhancement curve is small, scanning by the CT apparatus with the best timing for obtaining the most effective contrast enhancing effect is possible. Accordingly, there is no need for setting the margin for allowance in the time-contrast enhancement curve that requires a redundant amount of contrast medium, and thus the amount of contrast medium to be injected can be reduced.

In recent years, the performance of a CT scanner has advanced, and the available apparatus includes a high speed multi-slice CT scanner that allows short time diagnostics. While the period in which an enhancing effect is obtained may be shortened, the timing of starting CT scanning in relation to the time-contrast enhancement curve has become much more important. In the present invention, a deviation of timing can be reduced. With the combination of the use of a high speed multi-slice CT scanner, the present invention allows a further decrease the amount of contrast medium to be injected.

If attempting the same injection without the use of the injector of the present invention as the present invention can do, enormous complicated efforts are required, such as calculating a necessary amount of a contrast medium taking into account a CT scanner to be used, the purpose of diagnostics, body region to be imaged, body weight of a patient, concentration of the effective component in a contrast medium, and the like.

In the present invention, a base-operation condition for each body region is stored, wherein in case CT scanner and/or purpose of diagnostics is different, either different base-operation conditions are stored or the base-operation condition is changeable, and a time-injection rate pattern is calculated on the basis of the base-operation condition, and body weight of patient and contrast medium products. Thus, the reliable diagnostics is attained according to the injector of the present invention.

Further, when selecting the body region to be imaged, in the present invention, one of "body sections in schematic images of shapes of a human body" displayed on a touch panel screen is touched to select a body section, and then regions of the human body in schematic images of shapes of regions that corresponds to the selected body section is touched to select a region to be imaged. This is extremely intuitive and stress-free selection, which allows an effective injection based on the above complicated calculation with a very simple operation.

Claims 1-12, 14-17 and 19-39 were newly rejected under 35 U.S.C. § 103 as being obvious over Duchon in view of Langlotz and Uber. However, it is respectfully submitted that the new claims define over this prior art.

Applicants therefore believe that the present application is in a condition for allowance and respectfully solicit an early Notice of Allowability.

Respectfully submitted,

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